This is the first time for several years that it has been possible to observe the decline to eighth magnitude of this wonderful star. It is of interest to note the unevenness of the pace at which it varied. In its ascending stage it took only twenty-five days to increase from the luster of γ *Ceti* to that of α *Ceti;* but in the process of decline forty-two days were required to sink to equality with the lesser star. When the maximum was past, there was no revival of lost light, except what may be attributed to atmospheric causes; but the decline from fourth to fifth and from seventh to eighth magnitude was more rapid than the intervening variations.

SAN FRANCISCO, March 11, 1899.

PLANETARY PHENOMENA FOR MAY AND JUNE, 1899.

BY PROFESSOR MALCOLM MCNEILL.

MAY.

Mercury is a morning star throughout the month, and comes to its greatest western elongation on May 9th. The planet is then near its aphelion, and the apparent distance, 26°, is quite large, but since the planet is about 10° south of the Sun the interval between the rising of the planet and sunrise will be only about an hour, and *Mercury* cannot be seen except under very good weather conditions during the first half of the month.

Venus is a morning star, and throughout the month rises about $1^h\ 20^m$ before sunrise. It is moving eastward and northward through the constellation *Pisces* into *Aries* with a velocity just a little greater than that of the Sun's apparent motion among the stars, the total distance traversed being about 35°.

Mars still remains in good position for evening observation, and does not set until after midnight until nearly the end of the month. During the month it moves about 15° eastward and 5° southward from the constellation *Cancer* into *Leo*, from a position near γ *Cancri* to a position 5° west and 3° north of *Regulus*, the brightest star in *Leo*. Its actual distance from the Earth keeps on increasing at the rate of over 20,000,000 miles per month, and it is losing constantly in brightness.

Jupiter is in good position for observation, being well above the horizon at sunset, and not setting until long after midnight. It is in the constellation *Libra*, and moves westward and northward about 3° during the month. At the end of the month it lies about half-way between α *Librae* and *Spica* (α *Virginis*).

Saturn is gradually getting into position for evening observation, and rises during the evening twilight at the end of the month. It is in the southern part of *Ophiuchus*, near *Scorpio* and *Sagittarius*, and moves about 2° westward during the month.

Uranus is in opposition with the Sun on May 27th, and is above the horizon during the entire night at that time. It is in the constellation *Scorpio*, 5° north of the first-magnitude star, *Antares*, and moves about 1° westward during the month.

Neptune is in the eastern part of *Taurus*.

JUNE.

Eclipses. The first is a *partial eclipse of the Sun* on June 8th. It will be visible in Europe and throughout the regions not too far from the North Pole, including Alaska, where the eclipse occurs at about sunset of June 7th.

The second is a *total eclipse of the Moon.* It will not be visible in the eastern part of the United States, but the beginning of it may be seen in the far west a little before sunrise on June 23d.

Mercury is a morning star at the beginning of the month, too near the Sun to be seen. It rapidly nears the Sun, passes superior conjunction on June 14th, and becomes an evening star. Its distance from the Sun increases rapidly, and by the end of the month it is far enough away so that it can be seen in the evening twilight.

Venus still keeps up its eastward motion just a little faster than the Sun's, and rises less than an hour and a half before sunrise. It moves from *Aries* nearly through *Taurus*.

Mars is gradually drawing nearer the Sun in apparent position, and is no longer a conspicuous object. It moves 16° eastward and 6° southward through the constellation *Leo*, and on June 12th passes less than 1° north of *Regulus*, the principal star of the constellation. At the end of the month its distance from the Earth is 176,000,000 miles, and its light will be only about one ninth of what it was at opposition.

Jupiter does not set until after midnight. It is in the constel-

lation *Libra*, and moves westward 1° until June 27th, when it begins to move eastward.

Saturn rises about sunset, and can be seen throughout the entire night. It is in opposition with the Sun on June 11th. It is in the extreme southern part of *Ophiuchus*, and moves westward about 2°.

Uranus is about an hour's motion ahead of *Saturn*, is in the constellation *Scorpio*, and moves westward about 1°. It is 5° north and west of *Antares*, and 3° east and 1½° south of *β Scorpii* at the end of the month.

Neptune is in conjunction with the Sun on June 15th.

PHASES OF THE MOON, P. S. T.

		H. M.			H. M.	
Last Quarter,	May 2,	9 47	A. M.			
New Moon,	May 9,	9 39	A. M.	June 7,	10 20	P. M.
First Quarter,	May 17,	9 13	A. M.	June 16,	1 46	A. M.
Full Moon,	May 24,	9 49	P. M.	June 23,	6 20	A. M.
Last Quarter,	May 31,	2 55	P. M.	June 29,	8 45	P. M.

THE SUN.

1899.	R. A. H. M.	Declination. ° ′	Rises. H. M.		Transits. H. M.		Sets. H. M.	
May 1.	2 34	+ 15 6	5 5	A.M.	11 57	A.M.	6 49	P.M.
11.	3 12	+ 17 54	4 53		11 56		6 59	
21.	3 52	+ 20 12	4 44		11 56		7 8	
June 1.	4 37	+ 22 4	4 39		11 58		7 17	
11.	5 18	+ 23 6	4 35		11 59		7 23	
21.	5 59	+ 23 27	4 36		12 1	P.M.	7 26	
July 1.	6 41	+ 23 7	4 40		12 4		7 28	

MERCURY.

May 1.	1 6	+ 4 26	4 15	A.M.	10 30	A.M.	4 45	P.M.
11.	1 36	+ 6 32	3 57		10 19		4 41	
21.	2 23	+ 11 14	3 48		10 27		5 6	
June 1.	3 35	+ 17 53	3 52		10 55		5 58	
11.	5 0	+ 23 11	4 17		11 41		7 5	
21.	6 35	+ 24 55	5 5		12 37	P.M.	8 9	
July 1.	7 59	+ 22 30	6 1		1 22		8 43	

VENUS.

May 1.	0 22	+ 0 38	3 43	A.M.	9 45	A.M.	3 47	P.M.
11.	1 6	+ 5 8	3 33		9 50		4 7	
21.	1 51	+ 9 32	3 23		9 56		4 29	
June 1.	2 42	+ 14 0	3 15		10 3		4 51	
11.	3 30	+ 17 32	3 10		10 11		5 12	
21.	4 20	+ 20 20	3 10		10 22		5 34	
July 1.	5 11	+ 22 16	3 14		10 34		5 54	

MARS.

May	1.	8	39	+	20	32	10	48	A.M.	6 1	P.M. 1 14 A.M.
	11.	8	58	+	19	6	10	34		5 41	12 48
	21.	9	17	+	17	29	10	20		5 21	12 22
June	1.	9	40	+	15	31	10	6		5 0	11 54 P.M.
	11.	10	0	+	13	34	9	54		4 41	11 28
	21.	10	21	+	11	28	9	44		4 23	11 2
July	1.	10	43	+	9	13	9	33		4 5	10 37

JUPITER.

May	1.	14	11	−	11	43	6	12	P.M.	11 32	P.M. 4 52 A.M.
June	1.	13	59	−	10	40	3	55		9 18	2 41
July	1.	13	55	−	10	27	1	52		7 16	12 40

SATURN.

May	1.	17	30	−	21	47	10	13	P.M.	2 55	A.M. 7 37 A.M.
June	1.	17	22	−	21	40	8	2		12 45	5 28
July	1.	17	13	−	21	33	5	50		10 33	P.M. 3 16

URANUS.

May	1.	16	21	−	21	23	9	3	P.M.	1 46	A.M. 6 29 A.M.
June	1.	16	16	−	21	11	6	51		11 35	P.M. 4 19
July	1.	16	11	−	20	59	4	47		9 32	2 17

NEPTUNE

May	1.	5	29	+	22	0	7	33	A.M.	2 52	P.M. 10 11 P.M.
June	1.	5	34	+	22	4	5	36		12 55	8 14
July	1.	5	39	+	22	7	3	37		10 57	A.M. 6 17

ECLIPSES OF *JUPITER'S* SATELLITES, P. S. T.

(Off right-hand limb as seen in an inverting telescope.)

			H.	M.					H.	M.
III, R,	May	2.	10	11 P.M.	I, R,	June	4.	3	58	A.M.
II, R,		4.	9	42	I, R,		5.	8	27	P.M.
I, R,		4.	11	53	II, R,		5.	9	29	
I, R,		6.	6	22	III, R,		7.	6	2	
III, R,		10.	2	9 A.M.	I, R,		12.	10	21	
II, R,		12.	12	19	II, R,		13.	12	7	A.M.
I, R,		13.	8	15 P.M.	III, D,		14.	8	31	P.M.
II, R,		19.	2	56 A.M.	III, R,		14.	10	0	
I, R,		20.	10	10 P.M.	I, R,		20.	12	15	A.M.
I, R,		28.	12	4 A.M.	I, R,		21.	6	44	P.M.
I, R,		29.	6	32 P.M.	III, D,		22.	12	30	A.M.
II, R,		29.	6	52	I, R,		28.	8	39	P.M.